

Wetland Mitigation and Corridor Revegetation Site Monitoring for FAP 658 (IL 29), Sangamon County, Illinois – 2004

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Introduction

Wetland mitigation activity has been initiated along Illinois Route 29 (FAP 658) in Sangamon County, Illinois. The legal location of the site is SE/4 of NW/4 of Sec. 33, T. 17 N., R. 5 W. (Athens, IL Quad). The wetland replacement site is located in a former agricultural field classified as prior converted wetland by the NRCS. The mitigation site assessment for this area suggested that floodplain forest would be the most likely development for this site (Plocher and Tessene 1995).

Plocher and Tessene (1995) surveyed the mitigation area in August 1995 and found 0.93 ha (2.3 ac) of NRCS Prior Converted Wetland that still met the three criteria for a wetland. Since then, the site has been excavated to create more low depressional ground to support wetland vegetation. The site is divided into two areas. Area A, the south half of the mitigation site, initially was to be planted with woody hydrophytic species. In 2001, however, the wetland compensation plan was modified for this area and it was planted with herbaceous vegetation only (Brooks 2001). Emergent herbs planted in Area A were *Asclepias incarnata*, *Leersia oryzoides*, *Eupatorium maculatum*, *Spartina pectinata*, and *Calamagrostis canadensis*. Field monitoring of this area began during the 2001 growing season and will continue for the standard five-year monitoring period (2001-2005) or until no longer required by the Illinois Department of Transportation (IDOT). Area B, at the north end of the mitigation site, was planted with a wetland grass seeding (*Elymus canadensis*, *Elymus virginicus*, *Spartina pectinata* and *Calamagrostis canadensis*) and with woody hydrophytic species (*Quercus palustris*, *Quercus bicolor*, *Betula nigra*, *Fraxinus pennsylvanica*, and *Carya illinoensis*). Field monitoring of this area began during the 2000 growing season and will also continue for the standard five years (2000-2004) or until no longer requested by IDOT. The Illinois State Geological Survey (ISGS) was tasked to monitor the hydrology of this mitigation site. Project goals, objectives, and performance criteria are included in this report, as are monitoring methods, monitoring results, summary information, and recommendations.

Project Goals, Objectives, and Performance Criteria

Proposed goals and objectives for the wetland mitigation project are based on information contained in the original IDOT project request (Brooks 2000) and in the modified project request (Brooks 2001). Performance criteria are based on those specified in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and *Guidelines for Developing Mitigation Proposals* (USACOE 1993). Each goal should be attained by the end of the five-year monitoring period. Project goals, objectives and performance criteria are listed below.

Project Goal #1: At the end of the five-year monitoring period both created wetland communities should be jurisdictional wetlands as defined by current federal standards.

Objective: The created wetland should comprise 2.43 hectares (6.0 acres) of jurisdictional wetland.

Performance Criteria: The entire created wetland should satisfy the three criteria of the federal wetland definition: dominant hydrophytic vegetation, hydric soils, and wetland hydrology.

- A. Predominance of Hydrophytic Vegetation – More than 50% of the dominant plant species must be hydrophytic.
- B. Presence of Hydric Soils – Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at this site.
- C. Presence of Wetland Hydrology – The compensation area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season.*

Project Goal #2: In Area B, a floodplain forest wetland community will be created.

Objective: Planting the area with hydrophytic tree species should compensate for the loss of previously altered wetlands.

Performance Criteria: Seventy-five percent of the planted trees should be in a live and healthy condition each year for five years.

Project Goal #3: In Area A, a native, non-weedy, emergent wetland community will be created.

Objective: Planting the area with high quality native emergent vegetation should reduce the pressures from successional, non-native, weedy species.

Performance Criteria: In the Area A wetland site, at least 90% of the plant species present should be non-weedy, native, perennial and annual species, and none of the dominant plant species may be non-native or weedy species, such as cattails, sandbar willow or reed canary grass.

Methods

Monitoring is to be performed on two areas of the constructed wetland site. The monitoring for Area B, consisting of wetland determinations and tree survivorship surveys, began in 2000 and will continue for a minimum of five years (2000-2004). Both the wet shrubland and upland shrubland community will be assessed. Herbaceous vegetation in Area A (both wet meadow and forbland community) was monitored for the first time in 2001, after the area had been fully

* In some cases wetland hydrology can be met when a site is inundated or saturated for 5% to 12.5% of the growing season (Environmental Laboratory 1987).

planted. Likewise, Area A will also be monitored for at least the standard five-year monitoring period (2001-2005). Illinois Natural History Survey (INHS) personnel will monitor the biological parameters while ISGS personnel will monitor hydrology. Yearly tree surveys in Area B and herbaceous sampling in Area A will be submitted in yearly monitoring reports submitted to IDOT on the status of the created wetland site. The likelihood of meeting the proposed goals and performance criteria will also be addressed. If, at any time during the monitoring period, it appears that the goals/performance criteria will not be met at the end of the five-year monitoring period, written management recommendations will be made to IDOT in an effort to correct any problems.

Floristic Quality Index (FQI)

For both Area A and Area B, a complete list of all plant species found in each plant community will be recorded and the FQI will be calculated (Taft *et al.* 1997). The FQI will be calculated both with and without planted species. This index provides a measure of the floristic integrity or level of disturbance of a site. Each native plant species is assigned a rating between 0 and 10 (the Coefficient of Conservatism) that is a subjective indicator of how likely a plant may be found on an undisturbed site in a natural plant community. A plant species that has a low Coefficient of Conservatism (C) is common and is likely to tolerate disturbed conditions; a species with a high C is relatively rare and is likely to require specific, undisturbed habitats. Species not identified to species level are not rated and are not included in the calculations.

To calculate the FQI, first compute the mean C value (also known as mean rated quality), $mCv = \sum C/N$, where $\sum C$ represents the sum of the numerical ratings (C) for all species recorded for a site, and N represents the number of plants on the site. The C value for each species is shown in the species list for the site (Appendix 2). Species that are not native to Illinois (indicated by * in the species list for each site) are not included in the calculations. The FQI for each site is determined by dividing the $\sum C$ value by the square root of N [$\sum C/(\sqrt{N})$]. An Index score below 10 suggests a site of low natural quality; below 5, a highly disturbed site. An FQI value of 20 ($mCv > 3$) or more suggests that a site has evidence of native character and may be considered an environmental asset.

Project Goal #1

Wetland delineations will be completed yearly for both wetland and upland community types at this creation site. Results of these determinations are summarized below and are described in more detail on the accompanying forms (Appendix 2). Since accurate boundaries may not be clear until several years of data have been gathered, wetland areas marked on the enclosed aerial photograph (Figure 2) are subject to change. In addition, permanent photo stations have been established in each wetland restoration area and photos will be taken annually in order to help monitor changes in the vegetation.

A. Predominance of Hydrophytic Vegetation – The method for determining dominant hydrophytic vegetation is described in Environmental Laboratory (1987) and Federal Interagency Committee for Wetland Delineation (1989). This method is based on aerial coverage estimates for individual plant species. Each of the dominant plant species is assigned a wetland indicator status rating (Reed 1988). Any plant rated facultative or wetter (i.e., FAC, FAC+, FACW-,

FACW, FACW+ and OBL) is considered hydrophytic. A predominance of hydrophytic vegetation in the wetland plant community exists if greater than 50% of the dominant species present are hydrophytes. Planted species are not included in the percentage of dominant hydrophytic vegetation.

In Area A, dominant hydrophytic vegetation for all plant communities present will be determined each year based on results of systematic plant sampling. Area A will be monitored for at least the standard five-year monitoring period (2001 to 2005). Transects have been established perpendicular to the long axis of the adjacent field beginning at 15 m from the north end of Area A and continuing every 30 m afterwards. Quadrats (0.25 m²) are to be placed at 4.5 m intervals along each transect so that each planting zone has equal opportunity to be sampled. A minimum of 30 quadrats will be sampled each year in Area A. Cover of all species in each plot is assigned a cover class (Table 1) (Daubenmire 1959). Frequency (proportion of quadrats in which a species occurred) and average cover (calculated using midpoints for each cover class) will be used to compute relative frequency (frequency of a species relative to total observations) and relative cover (cover relative to total observed cover), respectively. These two relative values are added to determine the importance value for each species sampled. Importance values will be used to determine dominant species. "Dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50% of the total dominance measure for the stratum, plus any additional species comprising 20% or more of the total dominance measure for the stratum" (FICWD 1989; Tiner 1999).

Table 1. Cover classes used in vegetation sampling at FAP 658 (IL 29), Sangamon County, Illinois.

Cover Class	Range of Cover (%)	Midpoint of Range (%)
1	0-5	3.0
2	5-25	15.0
3	25-50	37.5
4	50-75	62.5
5	75-95	85.0
6	95-100	97.5
(Daubenmire 1959)		

B. Presence of Hydric Soils – Soils, in each plant community, will be examined and described annually. A soil core collected from the same general area of the mitigation site will be examined for the presence of redoximorphic features. A detailed profile description of the soil using Munsell color charts to record soil colors will be included. Soil texture and structure will also be recorded. Hydric soils may develop slowly and characteristics may not be apparent during the first several years after project construction. In the absence of hydric soil indicators at that time, hydrologic data could be used as corroborative evidence that conditions favorable for hydric soil formation are present at the site.

C. Presence of Wetland Hydrology – The ISGS has been tasked to monitor hydrology at the proposed wetland site. To date they have installed two surface-water monitoring stations (RDS1 and RDS2), a rain gauge, five surface-water staff gauges (C, D, F, G, and H), and twelve shallow monitoring wells (1S – 12S) (Figure 1) (Pociask and Watson 2001; Pociask and Sabatini 2002; Pociask and Sabatini 2003; Pociask and Plankell 2004). ISGS began hydrologic monitoring at Area B in September 2000. Hydrologic monitoring of Area A began in December 2001. ISGS personnel will measure water levels monthly. In addition, INHS scientists will survey the site annually for field indicators of wetland hydrology.

Project Goal #2

In Area B, tree survivorship will be assessed each year for a five-year monitoring period (2000 to 2004). Initially the site was planted with a total of 544 trees. These trees included *Quercus palustris* (119), *Quercus bicolor* (106), *Betula nigra* (102), *Fraxinus pennsylvanica* (103) and *Carya illinoensis* (114). Some planting to replace dead trees has occurred since 2000. Annually, every tree will be located, identified to species, and determined to be alive or dead.

Project Goal #3

In the Area A wetland community, a complete species list will be compiled each year and species will be recorded as native or non-native and as weedy or non-weedy. Nativity of plants is determined by consulting Mohlenbrock (1986, 2002). Weedy species, for the purposes of this report, are defined as all non-native species and any native species assigned a Coefficient of Conservatism of 0 or 1 (Taft *et al.* 1997). Species given a C value of 0-1 correspond to Grime's ruderal species (Grime 1974; Grime *et al.* 1988), which include species adapted to frequent or severe disturbances (Taft *et al.* 1997).

Results

Floristic Quality Index (FQI): The FQI was calculated for this mitigation site using native species only. In Area B, the FQI was calculated in two ways. First the FQI was calculated using all species at the site, including the planted tree species. Then, the FQI was also calculated without planted species (spontaneous natives only). FQI for Area A was calculated using all native species in the species list.

Area A, comprised of both wet meadow and forbland communities, had a FQI of 11.1 (10.2 for the wet meadow community) and a mean C value of 1.7 (2.1 for the wet meadow community). These values are indicative of an area with fair natural quality. There were 46 species found in Area A (26 in the wet meadow); 41 (89%) were native (24 in the wet meadow, 92%). Notable species in Area A include *Ammania coccinea*, *Asclepias incarnata*, *Iris shrevei*, *Sagittaria latifolia*, and *Spartina pectinata*. Summary information for Area A is given in Tables 2 and 3. Area B, comprised of wet shrubland and upland shrubland community, had a FQI of 12.3 (11.7 for the wet shrubland community) and a mean C value of 1.9 (2.2 for the wet shrubland community) when planted material was included. These values dropped to 9.3 for the FQI (8.1 for the wet shrubland) and 1.6 for the mean C (1.7 for the wet shrubland community) when planted species were excluded. These values are indicative of an area with poor to fair natural quality. Area B had a total of 49 species; 41 were native (84%) in 2004. The wet shrubland

community had 32 species including 28 natives (88%). Notable species in Area B include *Ammania coccinea*, *Asclepias incarnata*, *Elymus virginicus*, and *Panicum virgatum*. Summary information for Area B is given in Tables 4 and 5.

Table 2. Summary table for Area A Wet Meadow (wetland) species list.	
Total Species Richness	26
Native Species Richness	24
% Native	92% (24/26)
% Native and Non-weedy	54% (14/26)
Mean Conservatism	2.1
Floristic Quality Index (FQI)	10.2
% Wetland Species (FAC to OBL)	96% (25/26)

Table 3. Summary table for Area A Forbland (upland) species list.	
Total Species Richness	35
Native Species Richness	31
% Native	89% (31/35)
% Native and Non-weedy	37% (13/35)
Mean Conservatism	1.4
Floristic Quality Index (FQI)	7.9
% Wetland Species (FAC to OBL)	86% (30/35)

Table 4. Summary table for Area B Wet Shrubland (wetland) species list.	
Total Species Richness	32
Native Species Richness	28
% Native	88% (28/32)
Mean Conservatism (with planted material)	2.2
Mean Conservatism (spontaneous natives only)	1.7
Floristic Quality Index (FQI) (with planted material)	11.7
FQI (spontaneous natives only)	8.1
% Wetland Species (OBL, FACW, FAC) (with planted material)	91% (29/32)
% Wetland Species (OBL, FACW, FAC) (w/o planted material)	89% (24/27)

Table 5. Summary table for Area B Shrubland (upland) species list.	
Total Species Richness	38
Native Species Richness	32
% Native	84% (32/38)
Mean Conservatism (with planted material)	1.7
Mean Conservatism (spontaneous natives only)	1.2
Floristic Quality Index (FQI) (with planted material)	9.7
FQI (spontaneous natives only)	6.2
% Wetland Species (OBL, FACW, FAC) (with planted material)	71% (27/38)
% Wetland Species (OBL, FACW, FAC) (w/o planted material)	67% (22/33)

Project Goal #1 At the end of the five-year monitoring period the created wetland community should be a jurisdictional wetland as defined by current federal standards.

Area A

A. Predominance of Hydrophytic Vegetation – The performance criterion requires that greater than 50% of the dominant plant species be hydrophytic. 2004 vegetation sampling results indicate that the dominant species in the wet meadow community are *Cyperus acuminatus* (OBL), *Leersia oryzoides* (OBL), and *Ammania coccinea* (OBL) (Table 6). Greater than 50% (100%) of the dominant plant species are hydrophytes; therefore, this site meets the criterion for predominance of hydrophytic vegetation.

Interestingly, based on vegetation sampling data, the remaining forbland area (non-wetland) within Area A also satisfies the performance criterion for hydrophytic vegetation. The dominants for 2004 are *Iva annua* (FAC), *Echinochloa muricata* (OBL), and *Cyperus acuminatus* (OBL) (Table 7).

Table 6. FAP 658 (IL 29) Wetland Mitigation Site vegetation sampling data for Area A wet meadow community including frequency, cover, and importance value for all species sampled in 2004.

Species	Indicator	Avg. Frequency	Rel. Frequency	Avg. Cover	Rel. Cover	Importance Value
<i>Cyperus acuminatus</i>	OBL	0.95	25.68	13.25	21.37	23.52
<i>Leersia oryzoides</i>	OBL	0.65	17.57	17.00	27.42	22.49
<i>Ammania coccinea</i>	OBL	0.70	18.92	15.00	24.19	21.56
<i>Echinochloa muricata</i>	OBL	0.55	14.86	9.25	14.92	14.89
<i>Eleocharis erythropoda</i>	OBL	0.05	1.35	4.25	6.85	4.10
<i>Iva annua</i>	FAC	0.20	5.41	1.13	1.81	3.61
<i>Xanthium strumarium</i>	FAC	0.15	4.05	0.38	0.60	2.33
<i>Polygonum pensylvanicum</i>	FACW+	0.10	2.70	0.88	1.41	2.06
<i>Polygonum ramosissimum</i>	FAC-	0.10	2.70	0.25	0.40	1.55
<i>Eleocharis obtusa</i>	OBL	0.05	1.35	0.13	0.20	0.78
<i>Ipomaea lacunosa</i>	OBL	0.25	3.18	4.38	3.19	3.19
<i>Iris shrevei</i>	FACW	0.29	3.68	2.40	1.75	2.72
<i>Sagittaria latifolia</i>	FACW	0.29	3.68	1.44	1.05	2.37
<i>Typha latifolia</i>	FACW	0.19	2.41	3.03	2.21	2.31
		3.70	100	62	100	100
<i>bare ground</i>				41		

Dominant species are in bold

Table 7. FAP 658 (IL 29) Wetland Mitigation Site vegetation sampling data for Area A forland community (non-wetland) including frequency, cover, and importance value for all species sampled in 2004.

Species	Indicator	Avg. Frequency	Rel. Frequency	Avg. Cover	Rel. Cover	Importance Value
<i>Iva annua</i>	FAC	0.83	16.48	22.64	50.46	33.47
<i>Echinochloa muricata</i>	OBL	0.83	16.48	6.11	13.62	15.05
<i>Cyperus acuminatus</i>	OBL	0.56	10.99	2.08	4.64	7.82
<i>Aster simplex</i>	OBL	0.33	6.59	3.61	8.05	7.32
<i>Bidens frondosa</i>	FACW	0.33	6.59	1.53	3.41	5.00
<i>Polygonum pensylvanicum</i>	FACW+	0.33	6.59	1.53	3.41	5.00
<i>Sida spinosa</i>	FACU	0.33	6.59	0.83	1.86	4.23
<i>Asclepias incarnata</i>	OBL	0.17	3.30	1.11	2.48	2.89
<i>Ipomaea lacunosa</i>	OBL	0.22	4.40	0.56	1.24	2.82
<i>Xanthium strumarium</i>	FAC	0.11	2.20	0.97	2.17	2.18
<i>Chamaesyce humistrata</i>	FACW	0.17	3.30	0.42	0.93	2.11
<i>Ambrosia trifida</i>	FAC+	0.06	1.10	0.83	1.86	1.48
<i>Eupatorium serotinum</i>	FAC+	0.06	1.10	0.83	1.86	1.48
<i>Ammania coccinea</i>	OBL	0.11	2.20	0.28	0.62	1.41
<i>Ipomaea hederacea</i>	FAC	0.11	2.20	0.28	0.62	1.41
<i>Rumex crispus</i>	FAC+	0.11	2.20	0.28	0.62	1.41
<i>Acer saccharinum</i>	FACW	0.06	1.10	0.14	0.31	0.70
<i>Amaranthus tuberculatus</i>	OBL	0.06	1.10	0.14	0.31	0.70
<i>Carex vulpinoidea</i>	OBL	0.06	1.10	0.14	0.31	0.70
<i>Eclipta prostrata</i>	FACW	0.06	1.10	0.14	0.31	0.70
<i>Polygonum ramosissimum</i>	FAC-	0.06	1.10	0.14	0.31	0.70
<i>Populus deltoides</i>	FAC+	0.06	1.10	0.14	0.31	0.70
<i>Solidago canadensis</i>	FACU	0.06	1.10	0.14	0.31	0.70
		5.06	100.00	44.86	100.00	100.00
bare ground				65.83		

Dominant species are in bold

B. Presence of Hydric Soils – The performance criterion requires that hydric soil characteristics be present, or conditions favorable for hydric soil formation should persist. Hydric soil has developed at the Area A wet meadow site. The wet meadow site is situated at a lower elevation relative to the soils for the rest of Area A. These new soils should continue to remain hydric so long as the hydrology continues.

The sedimentation from the flood event two years ago was not as apparent as in previous years. Concretions have formed, accounting for 5% of the second horizon. Clean sand grains were also very apparent in that horizon. A typical pedon for the wet meadow community in Area A is described in Table 8.

Table 8. Description of the soils for Area A wet meadow community (wetland).

Depth(in)	Matrix Color	Concentrations	Depletions	Texture	Structure
0-2	10YR 2/1			Silt	granular
2-23	2.5Y 3/1	10YR 4/4		Silty Clay	subangular blocky
23-31	2.5Y 4/1	10YR 3/4		Silty Clay	subangular blocky

Also of note, the remaining portion of Area A (forbland community) satisfies the criterion for hydric soil development. Soil development is underway on the remaining portion of this excavated site. There is distinct soil development and horizonation noticeable within the stratum. The colors observed, while still partially relic, are forming prominent hydric features. Based on field observations up to now, hydric soils have developed and should continue to remain hydric so long as the hydrology continues.

The sedimentation from the flood event two years ago was not as apparent as in previous years. Large concretions (approximately 5 mm in diameter) do exist accounting for 5% of the second horizon and 10-15% of the third horizon. A typical pedon for the forbland community in Area A is described in Table 9.

Table 9. Description of the soils for Area A forbland community (non-wetland).

Depth(in)	Matrix Color	Concentrations	Depletions	Texture	Structure
0-1	10YR 2/1			Silt	granular
1-6	10YR 3/1 & 10YR 5/6	7.5YR 5/8		Silty Clay Loam	granular to subangular blocky
6-18	10YR 4/1	7.5YR 4/6		Silty Clay Loam	subangular blocky
18-24	2.5Y 5/2	7.5YR 5/8		Silty Clay Loam	subangular blocky

C. Presence of Wetland Hydrology – The performance criterion requires that the compensation area must be either permanently or periodically inundated at average depths less than 2m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season (Environmental Laboratory 1987)*. The ISGS initiated water level monitoring at Area A in December 2001. Their findings for 2004 indicate that 0.6 ha (1.4 ac) of Area A conclusively satisfied the wetland hydrology criterion for greater than 12.5% of the growing season (Pociask and Plankell 2004; Figure 1). This area roughly corresponds to the INHS wet meadow community. Much of the INHS forbland community did not satisfy the wetland hydrology criterion in 2004. The area of satisfactory wetland hydrology is up somewhat from 2003 [0.1 ha (0.3 ac)] and significantly lower than 2002 when the entire site conclusively satisfied the wetland hydrology criterion (Pociask and Sabatini 2002; Pociask and Sabatini 2003). During visits to the site, the following indicators of wetland hydrology were present in Area A: areas of inundation, sediment deposits, and many areas of surface or near surface saturation.

* In some cases wetland hydrology can be met when a site is inundated or saturated for 5% to 12.5% of the growing season (Environmental Laboratory 1987).

Unusual circumstances affected the hydrology of the site during 2002. Floodwater from the Sangamon River overtopped the levee and drift was deposited as high as the access road to the east of Area A. A water control structure located in the south part of the levee surrounding the mitigation area was closed prior to this late spring flooding. Therefore, water was artificially trapped on the site for a very long duration of the 2002 growing season. Apparently, the farmer who owns the adjacent property dug a hole through the levee wall allowing his field to drain for a late planting of soybeans. This hole in the levee still remains. Since hydrologic input to the site has changed since its establishment, future ISGS monitoring well data will be needed to make a conclusive determination and to establish extent of wetland hydrology.

Area B

A. Predominance of Hydrophytic Vegetation – The performance criterion requires that greater than 50% of the dominant plant species be hydrophytic. Results for 2004 indicate the dominant herbaceous species in the Area B wet shrubland are *Cyperus acuminatus* (OBL), *Echinochloa muricata* (OBL), *Eleocharis erythropoda* (OBL), *Iva annua* (FAC), and *Polygonum pensylvanicum* (FACW+). The shrub/sapling layer dominants are the five planted tree species: *Betula nigra* (FACW), *Carya illinoensis* (FACW), *Fraxinus pennsylvanica* (FACW), *Quercus bicolor* (FACW+) and *Quercus palustris* (FACW). More than 50% (100%) of the dominant plant species are hydrophytes. This site meets the criterion for predominance of hydrophytic vegetation.

Interestingly, the remaining upland shrubland community within Area B also minimally satisfies the performance criterion for hydrophytic vegetation. The dominants for 2004 are *Aster pilosus* (FACU+), *Eupatorium serotinum* (FAC+), and *Iva annua* (FAC).

B. Presence of Hydric Soils – The performance criterion requires that hydric soil characteristics be present, or conditions favorable for hydric soil formation should persist. Soil development is well underway on the Area B wet shrubland. There is distinct soil development and horizonation noticeable within the stratum. The colors observed, while still partially relic, have formed prominent hydric features. Based on this and previous years observations, hydric soils have developed and should continue to be hydric if the hydrology continues. The soils within the wet shrubland community of Area B are situated slightly lower than the rest of this site. Due to the slight elevation difference these soils appear more hydric than the soils located higher within Area B. The lower horizon also contained a few concretions and was difficult to probe through. A typical pedon for the Area B wet shrubland community is described below (Table 10).

Table 10. Description of the soils for Area B wet shrubland community (wetland).

Depth(in)	Matrix Color	Concentrations	Depletions	Texture	Structure
0-4	10YR 3/1			Silty Clay	subangular blocky
4 – 12	10YR 2/1	10YR 3/3		Silty Clay	subangular blocky

Springfield, IL Route 29 Wetland Compensation Site (FAP 658)

Estimated Areal Extent of 2004 Wetland Hydrology

map based on IDOT design plans and ISGS topography rectified to USGS digital orthophotograph
Athens SW quarter quadrangle (ISGS 2004)

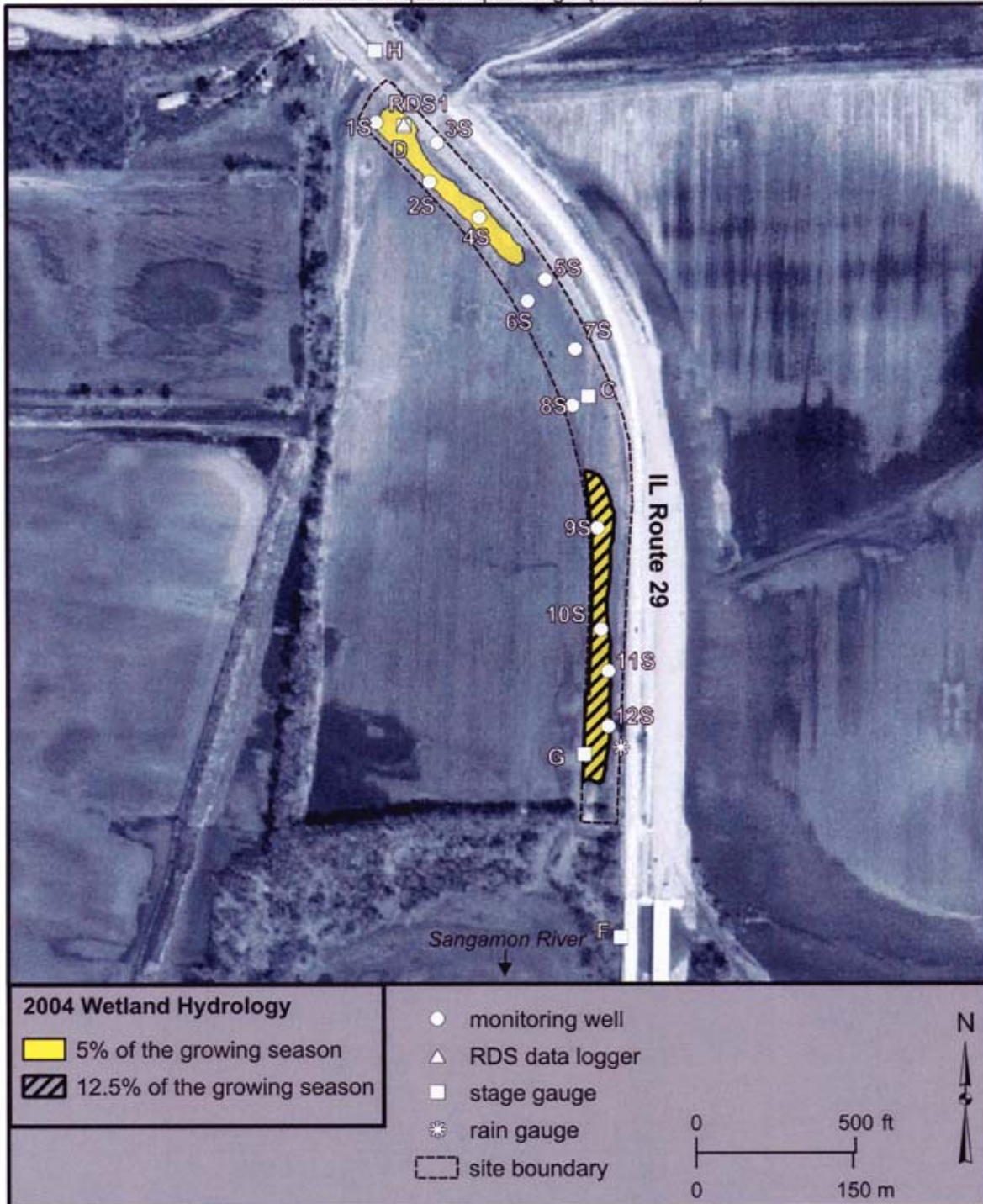


Figure prepared by ISGS.

Figure 1. 2004 aerial extent of wetland hydrology for Area A and Area B (from ISGS, Pociask and Plankell 2004).

Also of note, the remaining portion of Area B (upland shrubland community) appears to satisfy the criterion for hydric soil development. Distinct soil development and horizonation is noticeable within the excavated stratum. Prominent hydric features have formed. Based on this and previous years observations, hydric soils have developed and should continue to be hydric if the hydrology continues. A typical pedon for the upland shrubland community of Area B is described in Table 11.

Table 11. Description of the soils for Area B upland shrubland community.

Depth(in)	Matrix Color	Concentrations	Depletions	Texture	Structure
0-2	10YR 3/1			Silt Loam	granular
2 - 4	10YR 2/1	10YR 3/4	10YR 4/2	Silty Clay Loam	subangular blocky
4-24	10YR 2.5/1	10YR 4/4	10YR 4/2	Silty Clay Loam	subangular blocky

C. Presence of Wetland Hydrology – The performance criterion requires that the compensation area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season*. The ISGS initiated water level monitoring at this site in September 2000. Their findings for 2004 indicate that 0.4 ha (1.0 ac) satisfied the wetland hydrology criterion for 5% of the growing season (Pociask and Plankell 2004; Figure 1). This area roughly corresponds to the INHS wet shrubland community. Much of the INHS upland shrubland community did not satisfy the wetland hydrology criterion in 2004. The area of satisfactory wetland hydrology is up somewhat from 2003 when no part of Area B was found to satisfy the wetland hydrology criterion and is significantly lower than 2002 when the entire site conclusively satisfied the wetland hydrology criterion (Pociask and Sabatini 2002; Pociask and Sabatini 2003).

During visits to the site, the following indicators of hydrology were present in Area B: areas of surface or near surface saturation as well as a few areas of apparently prolonged inundation. Algal mats and mud cracks were also observed in this area. Much of the periphery of the wet shrubland community is at a higher landscape position and probably will not develop wetland characteristics. ISGS monitoring well data in the coming years will be needed to make a conclusive determination and to establish aerial extent of the wetland.

Project Goal #2: In Area B, a floodplain forest wetland community will be created.

All planted trees within Area B were located, identified and their condition was assessed. A total of 538 trees were found alive in 2004. In all 188 of 726 trees planted at this site have died (74% overall survival). Most (135) died between the 2001 and 2002 tree monitoring. During this intervening period, an extended flood event occurred at this site. *Fraxinus pennsylvanica* was especially hard hit with 82 dead. In 2002, tree survival fell below the 75% survivorship requirement for the first time with 72.9% (416/571) alive (Marcum *et al.* 2002). 2004 survival data shows a slight increase to 74% (538/726). *Quercus palustris* remained at its 2001 level with 95% survival. Likewise, *Betula nigra* and *Carya illinoensis* remained above the 75% survival

* In some cases wetland hydrology can be met when a site is inundated or saturated for 5% to 12.5% of the growing season (Environmental Laboratory 1987).

threshold. *Quercus bicolor* has shown significant decline in percent survival since 2003, largely the result of newly planted trees dying (trees planted within the past year). *Fraxinus pennsylvanica* has rebounded greatly since 2002 when percent survival was as low as 25%. In 2004 *Fraxinus pennsylvanica* survival increased to 55% due to a massive planting effort by IDOT. Table 12 shows the cumulative survivorship for each tree species planted in Area B.

Table 12. Cumulative tree survival for FAP 658 (IL 29) Area B – 2000 to 2004.

Species	# Alive	# Dead	Total Planted	% Survival
<i>Betula nigra</i>	109	13	122	89%
<i>Carya illinoensis</i>	115	22	137	84%
<i>Fraxinus pennsylvanica</i>	110	91	201	55%
<i>Quercus bicolor</i>	90	56	146	62%
<i>Quercus palustris</i>	114	6	120	95%
Totals	538	188	726	74%

Project Goal #3: In Area A, a native, non-weedy, emergent wetland community will be created.

The performance criteria for project goal #3 states that, in the wetland site at Area A, at least 90% of the plant species present should be non-weedy, native, perennial and annual species. In Area A, many weedy and non-native species were present during the first year of sampling (Marcum *et al.* 2001). Eighteen of the forty-one species (44%) found at this site in 2001 were native, non-weedy species. During the 2002 survey of Area A, very little vegetation was observed on the site and there were no dominant species present. Vegetation in Area A had been killed by an artificially prolonged flood event. The few plant species that were present consisted of early successional, native, weedy species. Only four of the sixteen species present in 2002 were native and non-weedy (25%) (Marcum *et al.* 2002). The 2003 species list of 50 species included 41 natives (82%) (Marcum and Kurylo 2003). Native, non-weedy species, however, accounted for only 36% of the total (18/50). In 2004 the percentage of native, non-weedy species rose to 54% (14/26). This part of the performance criteria was not satisfied in 2004.

The performance criteria for project goal #3 also states that none of the dominant plant species may be non-native or weedy species, such as cattails, sandbar willow or reed canary grass. In 2004 the Area A wet meadow dominants are *Ammania coccinea* (OBL), *Cyperus acuminatus* (OBL), and *Leersia oryzoides* (OBL). All of these species are native and considered to be non-weedy. This part of the performance criteria was satisfied in 2004.

Summary and Recommendations

Floristic Quality Index – Prolonged flooding in 2002 had a great impact on both Area A and B. Total species richness dropped (41 to 16 in Area A, 62 to 43 in Area B). Nonetheless, FQI and mean C scores have continued to show a gradual rise over the monitoring period. The FQI score for Area A (11.1) in 2004 was at its highest level in the four years of monitoring, and significantly higher than in 2002. Likewise, Area B's FQI scores have risen gradually since the initiation of monitoring activities. In 2004 the FQI for Area B was 12.3. While both sites have shown increases in natural quality, as measured by the FQI, the FQI scores are still relatively

low. These values are indicative of fair quality. Tables 13 and 14 show summary statistics for both sites from the onset of monitoring.

Table 13. Summary Table for Area A, 2001 to 2004.

	2000*	2001	2002▲	2003	2004
Total Species Richness	-----	41	16	50	46
Native Species Richness	-----	34	14	41	41
% Native	-----	83	88	82	89
% Native and non-weedy	-----	44	25	36	46
Mean Conservatism	-----	1.8	1.4	1.5	1.7
Floristic Quality Index (FQI)	-----	10.5	5.1	9.4	11.1
% Wetland Species	-----	83	88	82	89

*Area A was not monitored until 2001.

▲prolonged flooding occurred in 2002.

Table 14. Summary Table for Area B, 2000 to 2004.

	2000	2001	2002	2003	2004
Total Species Richness	50	62	43	65	48
Native Species Richness	30	43	34	49	41
% Native	60	69	79	75	85
Mean Conservatism (w/planted material)	1.8	1.6	1.9	1.8	1.9
Mean Conservatism (w/o planted material)	1.1	1.2	1.5	1.5	1.6
Floristic Quality Index (FQI) (w/planted material)	9.7	10.4	11.3	12.6	12.3
FQI (w/o planted material)	5.3	7.3	8.0	9.8	9.3
% Wetland Species (w/planted material)	54	60	81	66	77
% Wetland Species (w/o planted material)	52	56	79	63	74

Prolonged flooding, such as that which occurred in 2002, is not the normal circumstance. Under normal flooding regimes these sites should continue to develop into the predicted wetland communities with greater diversity than is now apparent. However, because of the dramatic setback, we suggest replanting of Area A with emergent hydrophytes to speed its recovery and to insure a higher quality wetland community. A list of possible additions to the site is included in Table 15 below. These species are all known from Sangamon County and are suitable for wet meadow or wet prairie plant communities.

Table 15. Plant species recommended for the wet meadow community at FAP 658 (IL 29) wetland mitigation site.

Scientific Name	Common Name	Stratum	Wetland Indicator Status	C♦	Perennial, Annual, Biennial
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4	Perennial
<i>Calamagrostis canadensis</i>	bluejoint grass	herb	OBL	3	Perennial
<i>Carex</i> spp.	sedge	herb	----	--	Perennial
<i>Cassia marilandica</i>	Maryland senna	herb	FACW	4	Perennial
<i>Cicuta maculata</i>	water hemlock	herb	OBL	4	Biennial
<i>Eupatorium perfoliatum</i>	common boneset	herb	FACW+	4	Perennial
<i>Helenium autumnale</i>	autumn sneezeweed	herb	FACW+	3	Perennial
<i>Hibiscus laevis</i>	halberd-leaved rose mallow	herb	OBL	4	Perennial
<i>Iris shrevei</i>	southern blue flag	herb	OBL	5	Perennial
<i>Leersia oryzoides</i>	rice cut grass	herb	OBL	3	Perennial
<i>Lythrum alatum</i>	winged loosestrife	herb	OBL	5	Perennial
<i>Mimulus alatus</i>	winged monkey flower	herb	OBL	6	Perennial
<i>Mimulus ringens</i>	monkey flower	herb	OBL	5	Perennial
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3	Perennial
<i>Pycnanthemum virginianum</i>	common mountain mint	herb	FACW+	5	Perennial
<i>Sagittaria latifolia</i>	arrowhead	herb	OBL	4	Perennial
<i>Scirpus cyperinus</i>	wool grass	herb	OBL	5	Perennial
<i>Scirpus tabernaemontani</i>	great bulrush	herb	OBL	4	Perennial
<i>Spartina pectinata</i>	freshwater cord grass	herb	FACW+	4	Perennial
<i>Vernonia fasciculata</i>	common ironweed	herb	FACW	5	Perennial

♦Coefficient of Conservatism (Taft *et al.* 1997)

Project Goal # 1 – The performance criterion requires that greater than 50% of the dominant plant species be hydrophytic, that hydric soil characteristics be present, or conditions favorable for hydric soil formation should persist, and that the compensation area must be either permanently or periodically inundated at average depths less than 2m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season*.

Area A

In 2004, Area A contained both a wet meadow and a forbland community. The wet meadow community exhibited dominant hydrophytic vegetation, hydric soils, and wetland hydrology.

INHS personnel have been monitoring vegetation and soil development in Area A for the past four years. INHS data from vegetation sampling, soil mapping, and general observations of wetland hydrology determine the aerial extent of the created wetland in Area A to be 0.19 ha (0.47 ac) (Appendix 1, Figure 2). Furthermore a large portion of Area A, thought to not satisfy the wetland hydrology criterion, was found to actually meet wetland hydrology standards in 2004 (Pociask and Plankell 2004). When this area is included the estimated aerial extent of the wetland within Area A is 0.6 ha (1.4 ac). The vegetation in this additional area is hydrophytic; however, the most dominant species, *Iva annua*, is rated as FAC (expected to occur in a wetland approximately 50% of the time). Furthermore, this portion of the site is located at a higher

*In some cases wetland hydrology can be met when a site is inundated or saturated for 5% to 12.5% of the growing season (Environmental Laboratory 1987).

topographic position than the rest of Area A. Future data from vegetation sampling, soil investigation, and hydrologic monitoring will be needed to determine if this additional area is a wetland.

Area B

In 2004, Area B contained both a wet shrubland and an upland shrubland community. The wet shrubland community exhibited dominant hydrophytic vegetation, hydric soils, and wetland hydrology.

INHS personnel have been monitoring vegetation and soil development in Area B for the past five years. INHS data from vegetation sampling, soil mapping, and general observations of wetland hydrology determine the aerial extent of the created wetland in Area B to be 0.26 ha (0.64 ac) (Appendix 1, Figure 2). Furthermore a large portion of Area B, thought to not satisfy the wetland hydrology criterion, was found to actually meet wetland hydrology standards in 2004 (Pociask and Plankell 2004). The vegetation in this additional area is hydrophytic, however, the dominant species [*Aster pilosus* (FACU+), *Eupatorium serotinum* (FAC+), and *Iva annua* (FAC)] are only marginally hydrophytic. Also, a small area thought to satisfy wetland hydrology was found to not meet the wetland hydrology criterion in 2004. When these areas are included the estimated aerial extent of the wetland within Area B is approximately 0.4 ha (1.0 ac).

Although this is the fifth year of monitoring for this area we recommend continued monitoring of Area B. Hydrologic conditions at this site have changed drastically since the initiation of monitoring activities. Future data from vegetation sampling, soil investigation, and hydrologic monitoring will be needed to determine if this additional area is a wetland.

Also, the stated objective for project goal #1 is to create 2.43 ha (6.0 ac) of jurisdictional wetland. According to the ISGS, the total area of the excavation [2.2 ha (5.4 ac)] is less than the required area (Pociask and Sabatini 2002).

Project Goal # 2 – The performance criterion requires that seventy-five percent of the planted trees should be in a live and healthy condition each year for five years. The performance criterion for this project goal was easily attained during the first two years of monitoring. In 2000 over 97% of the planted trees survived. Some replanting was done in 2001 and tree survival remained very high at 96.5% overall. During 2002, however, a prolonged flood event occurred and many of the planted trees were killed. Survival fell to 72.9%, just below the performance criterion of 75%. *Quercus palustris* (95.0%), *Betula nigra* (89.1%), and *Carya illinoensis* (83.3%) fared best and remained at acceptable levels. *Quercus bicolor* (71.7%) and especially *Fraxinus pennsylvanica* (25.2%) showed significant decline. Considering the severity and length of flooding on this site in 2002, the overall percent survival is higher than might be expected. The large, more mature size of the tree plantings is probably the reason for their greater success. In 2004, after some replanting in 2003 and 2004, the percent tree survival rose slightly to 74%. This value is just below 75%, the performance criterion set for this project goal. Although tree survival did not meet the proposed performance criterion for project goal #2 there are more live trees present within Area B in 2004 (538) than existed on the site in 2000 (530), when survival was well above the 75% threshold. Therefore, it is our opinion, that the performance criterion for project goal #2 should be considered satisfied.

Project Goal #3 – The performance criterion requires that, in the Area A wetland site, at least 90% of the plant species present should be non-weedy, native, perennial and annual species, and none of the dominant plant species may be non-native or weedy species, such as cattails, sandbar willow or reed canary grass.

The species list for the Area A wet meadow community (Table 2) is made up of mostly native species (92%). However, many of these native species are also considered weedy species. Only 54% of the plant species present in Area A are considered native and non-weedy. This is well below the stated performance criterion of 90%. This part of the performance criteria was not satisfied in 2004. Although low, the percent of native, non-weedy species has risen since monitoring was initiated in 2001. This percentage continues to rise each year, however, to help insure the creation of a high quality wetland we suggest planting or seeding of more conservative species at this site. A number of suggested species are listed in Table 15. It should be noted, however, that 90% native, non-weedy species may be an unrealistic goal.

As stated in the performance criterion, none of the dominant species may be non-native or weedy. Currently at Area A, the dominant species present are *Ammania coccinea* (OBL), *Cyperus acuminatus* (OBL), and *Leersia oryzoides* (OBL). All of the dominants are considered native and non-weedy. This part of the performance criterion was satisfied in 2004.

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Appendix 1.

Figure 2. 2004 INHS estimated extent of plant community types present at FAP 658 (IL 29) wetland mitigation site, Sangamon County, Illinois.

Legend:

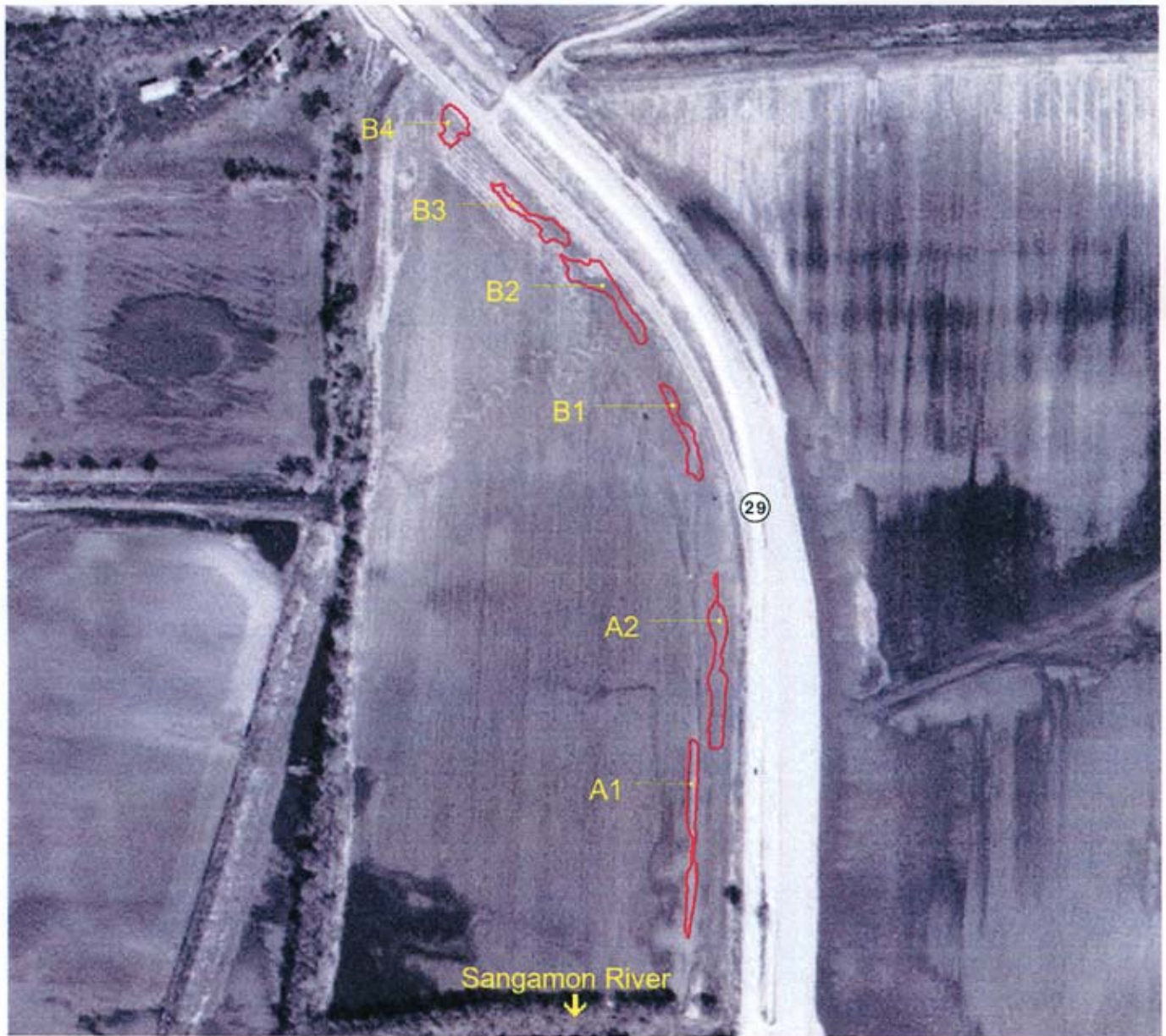
A1 and A2 = Area A wet meadow community type.

Area around A1 and A2 represent forland community type (some of this area was found to satisfy the wetland hydrology criterion in 2004).

B1, B2, B3, and B4 = wet shrubland (proposed wet floodplain forest) community type.

Area around B1, B2, B3, and B4 represent upland shrubland community (future upland floodplain forest) community type.

FAP 658, Mitigation Monitoring Site Sangamon County



0 400 800 Feet

0 100 200 Meters



Wetland site

- site A1 - 0.20 acre
- site A2 - 0.27 acre
- site B1 - 0.14 acre
- site B2 - 0.25 acre
- site B3 - 0.14 acre
- site B4 - 0.11 acre

scale 1:4800
1 inch=400 ft



Appendix 2. Wetland Determination Forms

ROUTINE ON-SITE WETLAND DETERMINATION

Area A – Wetland (page 1 of 4)

Field Investigators: Marcum, Kurylo, and Zercher

Date: 1 September and 12 October 2004

Project Name: FAP 658 (IL 29)

State: Illinois

County: Sangamon

Site Name: Wet Meadow

Legal Description: E1/2 of NE1/4 of SW1/4, Sect. 33, T.17 N., R.5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and begins approximately 488 m (1600 ft) north of the Sangamon River. This site continues north for approximately 427 m (1400 ft), where it meets Area B.

Do normal environmental conditions exist at this site? Yes: X No:

Has the vegetation, soils, or hydrology been significantly disturbed? Yes: X* No:

* This site is a recently excavated depression, created for mitigation purposes.

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. <i>Ammannia coccinea</i>	OBL	herb
2. <i>Cyperus acuminatus</i>	OBL	herb
3. <i>Leersia oryzoides</i>	OBL	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation? Yes: X No:

Rationale: Greater than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: NRCS mapped as Radford and Sawmill, revised to generic Mollic Endoaquent.

On county hydric soils list? Yes: No: Undetermined: X

Is the soil a histosol? Yes: No: X

Histic epipedon present? Yes: No: X

Redox Concentrations? Yes: X No: Color: 10YR 4/4

Redox Depletions? Yes: No: X

Matrix color: 10YR 2/1 over 2.5Y 4/1

Other indicators: Concretions. This soil did not meet any of the current NRCS hydric soil indicators (USDA, NRCS 2002).

Hydric soils? Yes: X No:

Rationale: This site is an excavated depression built for the purpose of mitigation. Although the top layers were removed exposing a poorly drained substratum, pedogenic processes have taken hold and a new hydric soil has since developed. This is evidenced by a low chroma matrix, redox features, and concretions.

ROUTINE ON-SITE WETLAND DETERMINATION
Area A- Wetland (page 2 of 4)

Field Investigators: Marcum, Kurylo, and Zercher

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Wet Meadow

Legal Description: E1/2 of NE1/4 of SW1/4, Sect. 33, T.17 N., R.5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and begins approximately 488 m (1600 ft) north of the Sangamon River. This site continues north for approximately 427 m (1400 ft), where it meets Area B.

Project Name: FAP 658 (IL 29)

County: Sangamon

HYDROLOGY

Inundated: Yes: No: X

Depth of standing water: NA

Depth to saturated soil: > 0.8 m (31 in)

Overview of hydrological flow through the system: This site receives water through precipitation, sheetflow from adjacent higher ground, and from flood events of the Sangamon River. In 2002, floodwater from the Sangamon River overtopped the levee surrounding this site. Water leaves the site via evapotranspiration, groundwater recharge, and normally through a water control structure in the levee at the south end of the site. Since 2002, a hole cut in the south levee wall allows floodwater to leave the site. This hole also allows water onto the site during less severe flood events. Size of watershed: Approximately 3885 km² (1500 mi²) (Wicker *et al.* 1997).

Other field evidence observed: This site has been excavated to hold water for longer periods. Areas of inundation, sediment deposits and many areas of surface or near surface saturation were observed at this site in 2004.

Wetland hydrology: Yes: X No:

Rationale: 2004 ISGS hydrological monitoring has determined that 0.6 ha (1.4 ac) conclusively satisfies the wetland hydrology criterion. At the end of the five-year monitoring period a conclusive area will be determined that exhibits wetland hydrology.

DETERMINATION AND RATIONALE:

Is the site a wetland?
Rationale for decision:

Yes: X No:
Dominant hydrophytic vegetation, hydric soils and wetland hydrology are present; therefore, this site is a wetland. Future data from vegetation sampling, soil investigation, and hydrologic monitoring will be needed to determine the aerial extent of the wetland in Area A.

ROUTINE ON-SITE WETLAND DETERMINATION

Area A - Wetland (page 3 of 4)

Field Investigators: Marcum, Kurylo, and Zercher

Date: 1 September and 12 October 2004

Project Name: FAP 658 (IL 29)

State: Illinois

County: Sangamon

Site Name: Wet Meadow

Legal Description: E1/2 of NE1/4 of SW1/4, Sect. 33, T.17 N., R.5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and begins approximately 488 m (1600 ft) north of the Sangamon River. This site continues north for approximately 427 m (1400 ft), where it meets Area B.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C ♦
<i>Acer saccharinum</i>	silver maple	herb	FACW	1
<i>Alisma plantago-aquatica</i>	broad-leaf water-plantain	herb	OBL	2
<i>Ammannia coccinea</i>	long-leaved ammannia	herb	OBL	5
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Bidens cernua</i>	nodding beggar's ticks	herb	OBL	2
<i>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Cyperus acuminatus</i>	taperleaf flat sedge	herb	OBL	2
<i>Cyperus erythrorhizos</i>	red-rooted sedge	herb	OBL	1
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Eleocharis erythropoda</i>	red-rooted spikerush	herb	OBL	3
<i>Eleocharis obtusa</i>	blunt spike rush	herb	OBL	2
<i>Ipomoea lacunosa</i>	small white morning-glory	herb	FACW	1
<i>Iris shrevei</i>	southern blue flag	herb	OBL	5
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum ramosissimum</i>	bushy knotweed	herb	FAC-	3
<i>Populus deltoides</i>	eastern cottonwood	herb	FAC+	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Sagittaria latifolia</i>	arrowhead	herb	OBL	4
<i>Spartina pectinata</i>	freshwater cord grass	herb	FACW+	4
<i>Typha angustifolia</i>	narrow-leaved cattail	herb	OBL	*
<i>Typha latifolia</i>	cattail	herb	OBL	1
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

♦ Coefficient of Conservatism (Taft *et al.* 1997)

*Non-native species

mean C value (mCv) = $\sum C/N = 50/24 = 2.1$

FQI = $\sum C/\sqrt{N} = 50/\sqrt{24} = 10.2$

ROUTINE ON-SITE WETLAND DETERMINATION
Area A - Wetland (page 4 of 4)

Field Investigators: Marcum, Kurylo, and Zercher

Date: 1 September and 12 October 2004

Project Name: FAP 658 (IL 29)

State: Illinois

County: Sangamon

Site Name: Wet Meadow

Legal Description: E1/2 of NE1/4 of SW1/4, Sect. 33, T.17 N., R.5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and begins approximately 488 m (1600 ft) north of the Sangamon River. This site continues north for approximately 427 m (1400 ft), where it meets Area B.

Determined by: Paul Marcum (vegetation and hydrology)
Jessica Kurylo (soils and hydrology)
Brad Zercher (GPS, GIS, and hydrology)
Geoff Pociask (ISGS; hydrology)
Eric Plankell (ISGS; hydrology)
Illinois Natural History Survey
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607 East Peabody Drive
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(217) 333-8459 (Marcum)

ROUTINE ON-SITE WETLAND DETERMINATION

Area A – Non-wetland (page 1 of 4)

Field Investigators: Marcum & Kurylo

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Forbland

Project Name: FAP 658 (IL 29)

County: Sangamon

Legal Description: E1/2 of NE1/4 of SW1/4, Sect. 33, T.17 N., R.5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and begins approximately 488 m (1600 ft) north of the Sangamon River. This site continues north for approximately 427 m (1400 ft), where it meets Area B.

Do normal environmental conditions exist at this site? Yes: X No:

Has the vegetation, soils, or hydrology been significantly disturbed? Yes: X* No:

* This site is a recently excavated depression, created for mitigation purposes.

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. <i>Cyperus acuminatus</i>	OBL	herb
2. <i>Echinochloa muricata</i>	OBL	herb
3. <i>Iva annua</i>	FAC	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:

Rationale: Greater than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: NRCS mapped as Radford and Sawmill, revised to generic Mollic Endoaquent.

On county hydric soils list? Yes: No: Undetermined: X

Is the soil a histosol? Yes: No: X

Histic epipedon present? Yes: No: X

Redox Concentrations? Yes: X No: Color: 7.5YR 4/6 and 5/8

Redox Depletions? Yes: X No: Color: 10YR 4/2 and 2.5Y 4/1

Matrix color: 10YR 2/1 over 10YR 3/1 mixed with 10YR 5/6 over 10YR 4/1

Other indicators: Concretions. This soil meets the F3 hydric soil indicator from NRCS (USDA, NRCS 2002).

Hydric soils? Yes: X No:

Rationale: This site is an excavated depression built for the purpose of mitigation. Although the top layers were removed exposing a poorly drained substratum, pedogenic processes have taken hold and a new hydric soil has since developed. This is evidenced by a low chroma matrix, redox features, and concretions.

ROUTINE ON-SITE WETLAND DETERMINATION
Area A – Non-wetland (page 2 of 4)

Field Investigators: Marcum & Kurylo
Date: 1 September and 12 October 2004
State: Illinois
Site Name: Forbland

Project Name: FAP 658 (IL 29)
County: Sangamon

Legal Description: E1/2 of NE1/4 of SW1/4, Sect. 33, T.17 N., R.5 W.
Location: The site is located immediately west of the new Illinois Route 29 embankment and begins approximately 488 m (1600 ft) north of the Sangamon River. This site continues north for approximately 427 m (1400 ft), where it meets Area B.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: > 0.6 m (24 in)

Overview of hydrological flow through the system: This site receives water through precipitation, sheetflow from adjacent higher ground, and from flood events of the Sangamon River. In 2002, floodwaters from the Sangamon River overtopped the levee surrounding this site. Water leaves the site via evapotranspiration, groundwater recharge, and normally through a water control structure in the levee at the south end of the site. Since 2002, a hole cut in the south levee wall allows floodwater to leave the site. This hole also allows water onto the site during less severe flood events. Size of watershed: Approximately 3885 km² (1500 mi²) (Wicker *et al.* 1997). Other field evidence observed: This site has been excavated to hold water for longer periods.

Wetland hydrology: Yes: X (in part) No:

Rationale: This site is at a higher topographic position compared to the Area A wet meadow community. Furthermore, 2004 ISGS hydrological monitoring data determined that this much of this site does not satisfy the wetland hydrology criterion.

DETERMINATION AND RATIONALE:

Is the site a wetland?	Yes:	No:	Undetermined: X
Rationale for decision:	Dominant hydrophytic vegetation and hydric soils are present; however, wetland hydrology is absent from most of this site. This site is undetermined. Future data from vegetation sampling, soil investigation, and hydrologic monitoring will be needed to determine if this any of this area is going to be considered wetland.		

ROUTINE ON-SITE WETLAND DETERMINATION

Area A – Non-wetland (page 3 of 4)

Field Investigators: Marcum & Kurylo

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Forbland

Project Name: FAP 658 (IL 29)

County: Sangamon

Legal Description: E1/2 of NE1/4 of SW1/4, Sect. 33, T.17 N., R.5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and begins approximately 488 m (1600 ft) north of the Sangamon River. This site continues north for approximately 427 m (1400 ft), where it meets Area B.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C♦
<i>Acer saccharinum</i>	silver maple	herb	FACW	1
<i>Amaranthus tuberculatus</i>	tall waterhemp	herb	OBL	1
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Ammannia coccinea</i>	long-leaved ammannia	herb	OBL	5
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster simplex</i>	panicked aster	herb	FACW	3
<i>Bidens comosa</i>	beggar's ticks	herb	OBL	2
<i>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
<i>Campsis radicans</i>	trumpet creeper	herb	FAC	2
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Chamaesyce humistrata</i>	milk spurge	herb	FACW	1
<i>Chamaesyce maculata</i>	nodding spurge	herb	FACU-	0
<i>Cyperus acuminatus</i>	taperleaf flat sedge	herb	OBL	2
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Eclipta prostrata</i>	yerba de tajo	herb	FACW	2
<i>Eragrostis pectinacea</i>	Carolina love grass	herb	FAC	0
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
<i>Ipomoea hederacea</i>	ivy-leaved morning glory	herb	FAC	*
<i>Ipomoea lacunosa</i>	small white morning-glory	herb	FACW	1
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum ramosissimum</i>	bushy knotweed	herb	FAC-	3
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix exigua</i>	sandbar willow	shrub	OBL	1

Species list continued on following page.

ROUTINE ON-SITE WETLAND DETERMINATION
Area A – Non-wetland (page 4 of 4)

Field Investigators: Marcum & Kurylo
Date: 1 September and 12 October 2004
State: Illinois
Site Name: Forbland

Project Name: FAP 658 (IL 29)
County: Sangamon

Legal Description: E1/2 of NE1/4 of SW1/4, Sect. 33, T.17 N., R.5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and begins approximately 488 m (1600 ft) north of the Sangamon River. This site continues north for approximately 427 m (1400 ft), where it meets Area B.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C ♦
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

♦ Coefficient of Conservatism (Taft *et al.* 1997)
*Non-native species

$$\text{mean C value (mCv)} = \sum C/N = 44/31 = 1.4$$

$$\text{FQI} = \sum C/\sqrt{N} = 44/(\sqrt{31}) = 7.9$$

Determined by: Paul Marcum (vegetation and hydrology)
Jessica Kurylo (soils and hydrology)
Geoff Pociask (ISGS; hydrology)
Eric Plankell (ISGS; hydrology)
Illinois Natural History Survey
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607 East Peabody Drive
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(217) 333-8459 (Marcum)

ROUTINE ON-SITE WETLAND DETERMINATION

Area B - Wetland (page 1 of 4)

Field Investigators: Marcum, Kurylo, and Zercher

Date: 1 September and 12 October 2004

Project Name: FAP 658 (IL 29)

State: Illinois

County: Sangamon

Site Name: Wet Shrubland

Legal Description: S1/2 of SE1/4 of NW1/4, Sect. 33, T.17 N., R.5 W. and NW1/4 of SE1/4 of NW1/4, Sect. 33, T. 17 N., R. 5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and approximately 975 m (3200 ft) north of the Sangamon River.

Do normal environmental conditions exist at this site? Yes: X No:

Has the vegetation, soils, or hydrology been significantly disturbed? Yes: X* No:

* This site is a recently excavated depression, created for mitigation purposes.

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. <i>Betula nigra</i>	planted	shrub/sapling
2. <i>Carya illinoensis</i>	planted	shrub/sapling
3. <i>Fraxinus pennsylvanica</i>	planted	shrub/sapling
4. <i>Quercus bicolor</i>	planted	shrub/sapling
5. <i>Quercus palustris</i>	planted	shrub/sapling
6. <i>Cyperus acuminatus</i>	OBL	herb
7. <i>Echinochloa muricata</i>	OBL	herb
8. <i>Eleocharis erythropoda</i>	OBL	herb
9. <i>Iva annua</i>	FAC	herb
10. <i>Polygonum pensylvanicum</i>	FACW+	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:

Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: NRCS mapped as Radford and Sawmill, revised to generic Mollic Endoaquent.

On county hydric soils list? Yes: No: Undetermined: X

Is the soil a histosol? Yes: No: X

Histic epipedon present? Yes: No: X

Redox Concentrations? Yes: X No: Color: 10YR 3/3

Redox Depletions? Yes: No: X

Matrix color: 10YR 3/1 over 10YR 2/1

Other indicators: A few concretions. This soil did not meet any of the current hydric soil indicators from NRCS (USDA, NRCS 2002).

Hydric soils? Yes: X No:

Rationale: This site is an excavated depression built for the purpose of mitigation. The top layers of soil had been removed leaving a poorly drained substratum with little or no soil development at the surface. Over the past four years though, new hydric soils have developed, as evidenced by a low chroma matrix and more redox features within the profile.

ROUTINE ON-SITE WETLAND DETERMINATION
Area B - Wetland (page 2 of 4)

Field Investigators: Marcum, Kurylo, and Zercher

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Wet Shrubland

Project Name: FAP 658 (IL 29)

County: Sangamon

Legal Description: S1/2 of SE1/4 of NW1/4, Sect. 33, T.17 N., R.5 W. and NW1/4 of SE1/4 of NW1/4, Sect. 33, T. 17 N., R. 5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and approximately 975 m (3200 ft) north of the Sangamon River.

HYDROLOGY

Inundated: Yes: X (in part) No: Depth of standing water: less than 5.1 cm (2 in)

Depth to saturated soil: >30.5 cm (12 in)

Overview of hydrological flow through the system: This site receives water through precipitation, sheetflow from adjacent higher ground and flood events of the Sangamon River. Water leaves the site via evapotranspiration, groundwater recharge, and sheetflow from this site to Area A.

Size of watershed: Approximately 3885 km² (1500 mi²) (Wicker *et al.* 1997).

Other field evidence observed: This site has been excavated to hold water for longer periods. Areas of surface or near surface saturation as well as a few areas of apparently prolonged inundation were observed at the site. The area satisfying wetland hydrology in 2004 [0.4 ha (1.0 ac); Figure 1] is somewhat more than in 2001 [0.17 ha (0.41 ac)] and 2003 [0 ha (0 ac)] and much less than was present in 2002 [1.2 ha (3.0 ac)] when the entire site met the wetland hydrology criterion (Pociask and Sabatini 2002; Pociask and Sabatini 2003; Pociask and Plankell 2004).

Wetland hydrology: Yes: X No:

Rationale: 2004 ISGS hydrological monitoring data has determined that 0.4 ha (1.0 ac) conclusively satisfies the wetland hydrology criterion. Hydrologic conditions at this site; however, have been very variable. Future data from ISGS hydrologic monitoring will be needed to determine the aerial extent of the wetland at Area B.

DETERMINATION AND RATIONALE:

Is the site a wetland?
Rationale for decision:

Yes: X No:

Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all present within the Area B wet shrubland community. Hydrologic conditions at this site; however, have been very variable. Future data from vegetation sampling, soil investigations, and ISGS hydrology monitoring will be needed to determine the aerial extent of the wetland at Area B.

ROUTINE ON-SITE WETLAND DETERMINATION
Area B – Wetland (page 3 of 4)

Field Investigators: Marcum, Kurylo, and Zercher

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Wet Shrubland

Project Name: FAP 658 (IL 29)

County: Sangamon

Legal Description: S1/2 of SE1/4 of NW1/4, Sect. 33, T.17 N., R.5 W. and NW1/4 of SE1/4 of NW1/4, Sect. 33, T. 17 N., R. 5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and approximately 975 m (3200 ft) north of the Sangamon River.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C♦
<i>Ammannia coccinea</i>	long-leaved ammannia	herb	OBL	5
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster simplex</i>	panicled aster	herb	FACW	3
♣ <i>Betula nigra</i>	river birch	shrub	FACW	4
<i>Bidens aristosa</i>	swamp marigold	herb	FACW	1
<i>Bidens cernua</i>	nodding beggar's ticks	herb	OBL	2
<i>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
♣ <i>Carya illinoensis</i>	pecan	shrub	FACW	6
<i>Cyperus acuminatus</i>	taperleaf flat sedge	herb	OBL	2
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Cyperus strigosus</i>	straw-colored flatsedge	herb	FACW	0
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Eleocharis erythropoda</i>	red-rooted spikerush	herb	OBL	3
♣ <i>Fraxinus pennsylvanica</i>	green ash	shrub	FACW	2
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3
<i>Panicum capillare</i>	witch grass	herb	FAC	0
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum lapathifolium</i>	curttop lady's thumb	herb	FACW+	0
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum ramosissimum</i>	bushy knotweed	herb	FAC-	3
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
♣ <i>Quercus bicolor</i>	swamp white oak	shrub	FACW+	7
♣ <i>Quercus palustris</i>	pin oak	shrub	FACW	4
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Typha angustifolia</i>	narrow-leaved cattail	herb	OBL	*

Species list continued on following page.

ROUTINE ON-SITE WETLAND DETERMINATION

Area B – Wetland (page 4 of 4)

Field Investigators: Marcum, Kurylo, and Zercher

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Wet Shrubland

Project Name: FAP 658 (IL 29)

County: Sangamon

Legal Description: S1/2 of SE1/4 of NW1/4, Sect. 33, T.17 N., R.5 W. and NW1/4 of SE1/4 of NW1/4, Sect. 33, T. 17 N., R. 5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and approximately 975 m (3200 ft) north of the Sangamon River.

SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland indicator status	C ♦
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

♦ Coefficient of Conservatism (Taft *et al.* 1997)

*Non-native species

♣ planted

with planted material

mean C value (mCv) = $\sum C/N = 62/28 = 2.2$

FQI = $\sum C/\sqrt{N} = 62/\sqrt{28} = 11.7$

without planted material

mean C value (mCv) = $\sum C/N = 39/23 = 1.7$

FQI = $\sum C/\sqrt{N} = 39/\sqrt{23} = 8.1$

Determined by: Paul Marcum (vegetation and hydrology)
Jesse Kurylo (soils and hydrology)
Brad Zercher (GPS, GIS, and hydrology)
Geoff Pociask (ISGS; hydrology)
Eric Plankell (ISGS; hydrology)
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(217) 333-8459 (Marcum)

ROUTINE ON-SITE WETLAND DETERMINATION

Area B – Non-wetland (page 1 of 4)

Field Investigators: Marcum & Kurylo

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Shrubland

Project Name: FAP 658 (IL 29)

County: Sangamon

Legal Description: S1/2 of SE1/4 of NW1/4, Sect. 33, T.17 N., R.5 W. and NW1/4 of SE1/4 of NW1/4, Sect. 33, T. 17 N., R. 5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and approximately 975 m (3200 ft) north of the Sangamon River.

Do normal environmental conditions exist at this site? Yes: X No:

Has the vegetation, soils, or hydrology been significantly disturbed? Yes: X* No:

* This site is a recently excavated depression, created for mitigation purposes.

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. <i>Betula nigra</i>	planted	shrub/sapling
2. <i>Carya illinoensis</i>	planted	shrub/sapling
3. <i>Fraxinus pennsylvanica</i>	planted	shrub/sapling
4. <i>Quercus bicolor</i>	planted	shrub/sapling
5. <i>Quercus palustris</i>	planted	shrub/sapling
6. <i>Aster pilosus</i>	FACU+	herb
7. <i>Eupatorium serotinum</i>	FAC+	herb
8. <i>Iva annua</i>	FAC	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 67%

Hydrophytic vegetation: Yes: X No:

Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: NRCS mapped as Radford and Sawmill, revised to generic Mollic Endoaquent.

On county hydric soils list? Yes: No: Undetermined: X

Is the soil a histosol? Yes: No: X

Histic epipedon present? Yes: No: X

Redox Concentrations? Yes: X No: Color: 10YR 3/4 & 10YR 4/4

Redox Depletions? Yes: X No: Color: 10YR 4/2

Matrix color: 10YR 3/1 over 10YR 2/1 over 10YR 2.5/1

Other indicators: This soil did not meet any of the current hydric soil indicators from NRCS (USDA, NRCS 2002).

Hydric soils? Yes: X No:

Rationale: This site is an excavated depression built for the purpose of mitigation. The top layers of soil had been removed leaving a poorly drained substratum with little or no soil development at the surface. Over the past four years though, new hydric soils have developed, as evidenced by a low chroma matrix and more redox features within the profile.

ROUTINE ON-SITE WETLAND DETERMINATION

Area B – Non-wetland (page 2 of 4)

Field Investigators: Marcum & Kurylo

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Shrubland

Legal Description: S1/2 of SE1/4 of NW1/4, Sect. 33, T.17 N., R.5 W. and NW1/4 of SE1/4 of NW1/4, Sect. 33, T. 17 N., R. 5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and approximately 975 m (3200 ft) north of the Sangamon River.

Project Name: FAP 658 (IL 29)

County: Sangamon

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA

Depth to saturated soil: >0.6 m (24 in)

Overview of hydrological flow through the system: This site receives water through precipitation, sheetflow from adjacent higher ground and flood events of the Sangamon River. Water leaves the site via evapotranspiration, groundwater recharge, and sheetflow from this site to Area B wet shrubland community and then to Area A.

Size of watershed: Approximately 3885 km² (1500 mi²) (Wicker *et al.* 1997).

Other field evidence observed: This site has been excavated to hold water for longer periods. This site is located at a higher topographic position when compared to the Area B wet shrubland site.

Wetland hydrology: Yes: No: X

Rationale: This site is at a higher topographic position compared to the Area B wet shrubland community. Furthermore, 2004 ISGS hydrological monitoring data determined that this site does not satisfy the wetland hydrology criterion.

DETERMINATION AND RATIONALE:

Is the site a wetland?

Rationale for decision:

Yes: No: Undetermined: X

Dominant hydrophytic vegetation and hydric soils are present; however, wetland hydrology is absent from most of this site. This site is undetermined. Future data from vegetation sampling, soil investigation, and hydrologic monitoring will be needed to determine if this any of this area is going to be considered wetland.

ROUTINE ON-SITE WETLAND DETERMINATION

Area B – Non-wetland (page 3 of 4)

Field Investigators: Marcum & Kurylo

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Shrubland

Project Name: FAP 658 (IL 29)

County: Sangamon

Legal Description: S1/2 of SE1/4 of NW1/4, Sect. 33, T.17 N., R.5 W. and NW1/4 of SE1/4 of NW1/4, Sect. 33, T. 17 N., R. 5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and approximately 975 m (3200 ft) north of the Sangamon River.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C♦
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster simplex</i>	panicled aster	herb	FACW	3
♣ <i>Betula nigra</i>	river birch	shrub	FACW	4
<i>Bidens aristosa</i>	swamp marigold	herb	FACW	1
<i>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
<i>Campsis radicans</i>	trumpet creeper	herb	FAC	2
♣ <i>Carya illinoensis</i>	pecan	shrub	FACW	6
<i>Chamaesyce nutans</i>	nodding spurge	herb	FACU-	0
<i>Cassia fasciculata</i>	partridge pea	herb	FACU-	1
<i>Conyza canadensis</i>	horseweed	herb	FAC-	0
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Eupatorium coelestinum</i>	blue boneset	herb	FAC+	3
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
♣ <i>Fraxinus pennsylvanica</i>	green ash	shrub	FACW	2
<i>Helianthus annuus</i>	common sunflower	herb	FAC-	*
<i>Ipomoea pandurata</i>	wild sweet potato vine	herb	FACU	2
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Lactuca serriola</i>	prickly lettuce	herb	FAC	*
<i>Panicum capillare</i>	witch grass	herb	FAC	0
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum lapathifolium</i>	curttop lady's thumb	herb	FACW+	0
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
♣ <i>Quercus bicolor</i>	swamp white oak	shrub	FACW+	7
♣ <i>Quercus palustris</i>	pin oak	shrub	FACW	4
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2

Species list continued on following page.

ROUTINE ON-SITE WETLAND DETERMINATION

Area B – Non-wetland (page 4 of 4)

Field Investigators: Marcum & Kurylo

Date: 1 September and 12 October 2004

State: Illinois

Site Name: Shrubland

Project Name: FAP 658 (IL 29)

County: Sangamon

Legal Description: S1/2 of SE1/4 of NW1/4, Sect. 33, T.17 N., R.5 W. and NW1/4 of SE1/4 of NW1/4, Sect. 33, T. 17 N., R. 5 W.

Location: The site is located immediately west of the new Illinois Route 29 embankment and approximately 975 m (3200 ft) north of the Sangamon River.

SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland indicator status	C ♦
<i>Salix exigua</i>	sandbar willow	shrub, herb	OBL	1
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Trifolium pratense</i>	red clover	herb	FACU+	*
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

♦ Coefficient of Conservatism (Taft *et al.* 1997)

*Non-native species

♣ planted

with planted material

mean C value (mCv) = $\sum C/N = 55/32 = 1.7$

FQI = $\sum C/\sqrt{N} = 55/\sqrt{32} = 9.7$

without planted material

mean C value (mCv) = $\sum C/N = 32/27 = 1.2$

FQI = $\sum C/\sqrt{N} = 32/\sqrt{27} = 6.2$

Determined by: Paul Marcum (vegetation and hydrology)
Jesse Kurylo (soils and hydrology)
Geoff Pociask (ISGS; hydrology)
Eric Plankell (ISGS; hydrology)
Illinois Natural History Survey
Center for Wildlife Ecology
607 East Peabody Drive
Champaign, Illinois 61820
(217) 333-8459 (Marcum)

Appendix 3. Photos of FAP 658 (IL 29) wetland creation sites.



Photo 1. View from south end of Area A, looking due north.



Photo 2. View from north end of Area A, looking due south.



Photo 3. View from the northeast corner of Area A, looking south.



Photo 4. View from the north end of Area B, looking due south.



Photo 5. View from the northeast corner of Area B, looking south.



Photo 6. View from the eastside center of Area B, looking south.